Modelling European Agriculture with Climate Change for Food Security

Benefits of climate modelling for actors along the food chain - reflections for further engagement between science and practice

Tania Runge

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Outline

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3. The climate strategy from the German Farmers' Association
4. The example of recent frost in vineyards

Climate aspects are not (yet) a driver for decision-taking at farm level in Europe
Decisions dominated by short-term economics and legislative constraints

BUT

European farmers facing shifts in weather patterns with weather extremes + will have to contribute to GHG emission reduction

Need for models which are able:

- to describe climate phenomena / likely pathways (inter-seasonal to decadal, local to global)
- to simulate possible options for (pre-)adaptation
- to identify cost-effective mitigation options
- to help finding synergies and avoiding trade-offs

2. Climate modelling → climate services

Translating users' needs into services by providing customised climate-related tools, products and information

-> a more systematic approach to risk management

-> to increase the quality and effectiveness of decision making on mitigation policies, resilient infrastructures, novel business opportunities, future investments

EC (2015): A European research and innovation Roadmap for Climate Services

Climate services implies

-> co-design, co-development and co-evaluation
-> a community with users, providers, purveyors and researchers
-> enhanced use in multiple data (physical, economic, social), e.g. Copernicus C3S
-> outputs faster available (e.g. risk disaster management)
-> improved realism and reliability of models
-> enhanced trust (e.g. use of case studies)

3. The climate strategy from the German Farmers' Association (DBV)

Objective of the climate strategy for 2030 (currently under preparation):
contribute to the Paris agreement alongside with the SDGs, without disruptive effects in German agriculture.

-> identify realistic emission reduction targets
-> cost-effective pathways for different farm types

Aspects looked at:

- fertilisation, manure fermentation
- soil organic matter content
- feeding diets
- renewables
- land sealing

(- forestry)

Changes in farm management due to climate adaptation and / or mitigation impact the whole value chain

- fertilizer management
- soil management
- livestock management
- crop choice
- energy efficiency

4. The example of recent frost

France, Spain, Italy, Germany, Austria, Czech Republic, hit by late spring frost this April
Damages reaching up to 100% for some winegrowers

photo: Bauern- und Winzerverband Rheinland-Nassau

Warm spring → begin of vegetation earlier (up to 2 weeks)

Great variation of the damage depending on topography, soil conditions and variety

Farmers:

Call for immediate financial support
(frost damage to be declared as natural disaster)

Trade:

Impact on regional and global market

Policy makers:

Sound estimations of the damage

photo: Bauern- und Winzerverband Rheinland-Nassau

Scientists:

predictions (Global risk index for wine producing regions)
strategy to achieve risk & damage minimization
no sole focus on frost, but also on hail, drought, heat wave

Contribution from climate modelling:

- improvements in predictions regarding frost risk / probability of frost damages and other climate related risks (hail, drought, heat waves)
- distinction natural disaster or „normal“ weather phenomena
- assessments of risk management tools: financial & technogical, incl. use of new technologies
- risk index for wine producing regions


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